Surface plasmon resonance optical sensor for mercury ion detection by crosslinked chitosan thin film.

Abstract

Mercury ion can be detected by measuring surface plasmon resonance signal with a thin crosslinked chitosan layer deposited on a gold film. The crosslinked chitosan is synthesized by homogeneous reaction of medium molecular weight chitosan in aqueous acetic acid solution with glutaraldehyde as crosslinking agent. By surface plasmon resonance sensor, the optical properties of crosslinked chitosan thin film before and after contacting with different concentration of mercury ion range 0.5 to 100 ppm have been obtained by fitting. The resonance angle shifted higher values to the left as the copper ion concentration increased. By introducing the crosslinked chitosan film, mercury ion detection can be obtained for concentration as low as 500 ppb using surface plasmon resonance technique.

Keyword: Surface plasmon resonance; Mercury ion; Crosslinked chitosan.